The Medication Metronome Project

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Summary: One goal of primary care is to reduce the morbidity and mortality of chronic diseases such as hypertension, type 2 diabetes, and hyperlipidemia. However, national and local data indicate that the United States health care system is falling significantly short of evidence-based goals for these three conditions, both in terms of risk-factor control and in monitoring adverse drug events. Novel uses of health information technology (IT) are needed to support more effective medication management for chronic diseases in the primary care setting.

The Medication Metronome Project is testing a model of chronic disease medication management in which specific clinical actions, such as the decision to initiate or adjust medications, are performed independently of the office visit. The study conducted a randomized controlled trial using an existing electronic health record (EHR) at Massachusetts General Hospital (MGH) to evaluate the value of an IT system that supports between-visit medication safety monitoring and dose adjustment. This "Medication Metronome" is designed to enable providers to schedule future laboratory tests related to a specific set of medications for glycemic, cholesterol, and blood pressure management. As these lab test dates become due, the Medication Metronome system reminds patients via letter and informs providers when the tests are "missing."

The goal of this intervention is to implement an efficient, visit-independent system to ensure that patients are rapidly and safely brought to evidence-based treatment goals and to prevent delays in planned laboratory monitoring. This will be achieved through an iterative process of medication adjustments so that risk-factor control is not entirely dependent upon face-to-face office visits. The broader goal is to foster greater patient-physician connectedness by combining independent medication management with more productive visit-based care. This research is relevant to nationwide efforts to demonstrate the most effective ways to implement new IT-based delivery models that expand care beyond the traditional clinic visit.

Specific Aims:

- Develop the Medication Metronome system. **(Achieved)**
- Conduct a randomized controlled trial of the Medication Metronome system. **(Ongoing)**
- Evaluate the impact of the Medication Metronome visit-independent care model on both the frequency and content of office-based visits. **(Upcoming)**

2012 Activities: The project team focused on the final testing of the Medication Metronome health IT system and launching the randomized controlled trial. A key requirement prior to initiating the system was the implementation of computerized lab order entry into participating practices. The lab order entry module

was finalized in March 2012 and onsite training sessions were conducted for staff at the study sites. The randomization of 44 primary care providers (PCPs) who consented to participate in the trial occurred in April 2012. Provider randomization was stratified by practice, panel size, and years since graduation. This resulted in 22 PCPs in each study arm. Following testing of the lab module, the Medication Metronome interface was re-tested and finalized and released to intervention group providers in May 2012.

Patient enrollment for audiotaped baseline interviews was completed in June 2012 with 49 patients from the participating practices. Baseline clinical encounters between study physicians and their patients were recorded in order to conduct content and frequency analyses. These baseline visits will be compared to followup visits approximately 1 year later. The transcription of the baseline recordings was completed in October 2012. The study team obtained patient scheduling data from the online patient scheduling system and is contacting enrolled patients to confirm visit dates for audiotaping of the followup encounters.

As last self-reported in the AHRQ Research Reporting System, the progress and activities are completely on track and project budget funds are moderately underspent. Initial underspending was related to the 10-month budget in the first year of the project and the short time frame from notification of grant award and time associated with billing for personnel costs for work performed. One major change made in the second year of the budget that has helped to decrease some of the underspending was increasing Dr. Atlas's level of effort to 20 percent full-time equivalent as he assumed the role of principal investigator (PI) after the previous PI took another position.

Preliminary Impact and Findings: The project has no findings to date.

Target Population: Chronic Care*, Diabetes, Hypertension

Strategic Goal: Develop and disseminate health IT evidence and evidence-based tools to improve the quality and safety of medication management via the integration and utilization of medication management systems and technologies.

Business Goal: Implementation and Use

** This target population is one of AHRQ's priority populations.*